

TRANSACETABULAR ARTHROTOMY OF THE HIP JOINT

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Removal of a loose body or some other lesion in the acetabular fossa by an ordinary arthrotomy of the hip joint can be extremely difficult and may necessitate dislocation of the femoral head with the ensuing risk of vascular disturbances. A method has been developed to overcome these difficulties. Essentially it implies that a hole is made centrally in the acetabular fossa from the intrapelvic side via an inferior midline abdominal incision and extraperitoneal dissection. After the hole has been made in the bone, the fat pad in the acetabular fossa (pulvinar acetabuli) is incised and the pathological lesion, e.g. a loose body, can easily be removed. Large areas of the femoral head can be inspected by movements of the joint in different directions. If indicated, the whole acetabular fossa can be removed leaving only the cartilage-covered part of the acetabulum (facies lunata) intact. The method has been successfully used in four hip joints in three patients.

Key words: arthrography; hip; osteochondral defects; osteochondritis dissecans; surgery

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Lesions in the acetabular fossa, e.g. a loose body, can be difficult to reach via an ordinary arthrotomy of the hip joint. Dislocation of the joint facilitates the approach but it carries a risk of damaging the nutrition of the femoral head. Dejour et al. (1975) performed a posterior acetabular osteotomy for removal of an osteoid-osteoma in the acetabular fossa, but the disadvantages of this approach are that the joint cartilage is cut through by the osteotome and that the temporarily removed segment of the acetabulum must be fastened by some kind of osteosynthesis after it has been returned to its original position. An operation that avoids the problems inherent in other approaches to the acetabular fossa will be described in this paper; using an extraperitoneal abdominal approach a hole is made in the bottom of the fossa. This operation has been carried out successfully in four hip joints in three patients.

OPERATIVE TECHNIQUE

An inferior midline abdominal incision is made through the skin and the linea alba, care being taken not to open the peritoneal cavity. On both sides, the tendon of the rectus abdominis muscle is severed approximately 1 cm above its insertion in the pubic bone. The lateral wall of the lesser pelvis is exposed by extraperitoneal dissection. The obturator artery and vein are divided and ligated, and the obturator nerve is released by sectioning the sharp edge of fascia that confines the internal opening of the obturator canal on the inferomedial side; the nerve can thereafter be retracted without any risk of being damaged. After incision of the obturator fascia, the obturator internus muscle is released subperiosteally with a raspator so that the pelvic bone is exposed opposite the acetabulum. The position of the centre of the acetabular fossa is checked using a metal indicator and fluoroscopy.

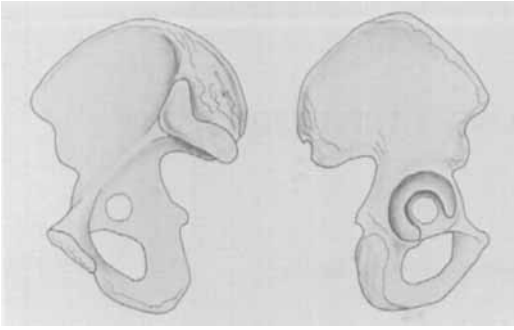


Figure 1. A hole has been made in the pelvis from the abdominal side, giving access to the acetabular fossa.

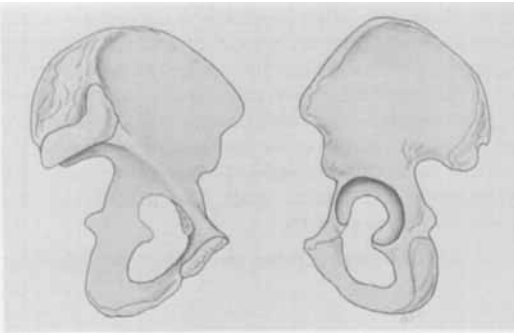


Figure 2. The whole acetabular fossa has been removed, but the cartilage-covered part of the acetabulum (facies lunata) has been left intact. Part of the superior ramus of the pubic bone has been removed to facilitate the approach.

Around this centre a hole is made in the bone with a chisel (Figure 1). The fat pad in the acetabular fossa (pulvinar acetabuli) is thereby exposed. By incising this fat pad the joint is opened and a lesion located in the acetabular fossa, e.g. a loose body, can easily be removed (Case 1). Large areas of the femoral head can be inspected by movements of the joint in different directions. If indicated, the whole acetabular fossa can be removed leaving only the cartilage-covered part of the acetabulum (facies lunata) intact (Figure 2, Case 2). The operation is completed by reattaching the tendons of the rectus abdominis muscles and by closing the divided linea alba.

ILLUSTRATIVE CASES

Case 1. A 19-year-old man had suffered pain in the right groin for about 1 year. Occasionally the lower limb had suddenly "given away" and sometimes the hip joint had become "locked". Plain radiography revealed a subchondral defect in the femoral head and arthrography showed a 1.5 by 2.5 cm large defect in the contrast medium in the acetabular fossa (Figure 3), which along with the history of "locking" suggested the presence of a loose body in the joint. At transacetabular arthrotomy (Figure 1) a tissue mass, apparently responsible for the defect in the contrast medium in the acetabular fossa, was removed, but no loose body could be found. On inspection, the articular cartilage of the femoral head was found to be uneven and fibrillated



Figure 3. Case 1. Preoperative arthrogram of the right hip joint.

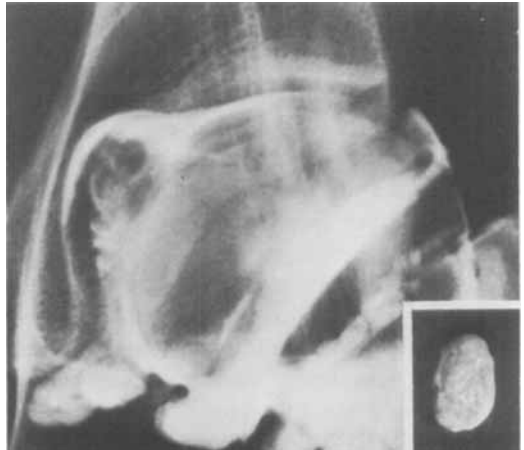


Figure 4. Case 1. Preoperative arthrogram of the left hip joint. Inset: Cartilaginous loose body removed from the acetabular fossa by a transacetabular arthrotomy.

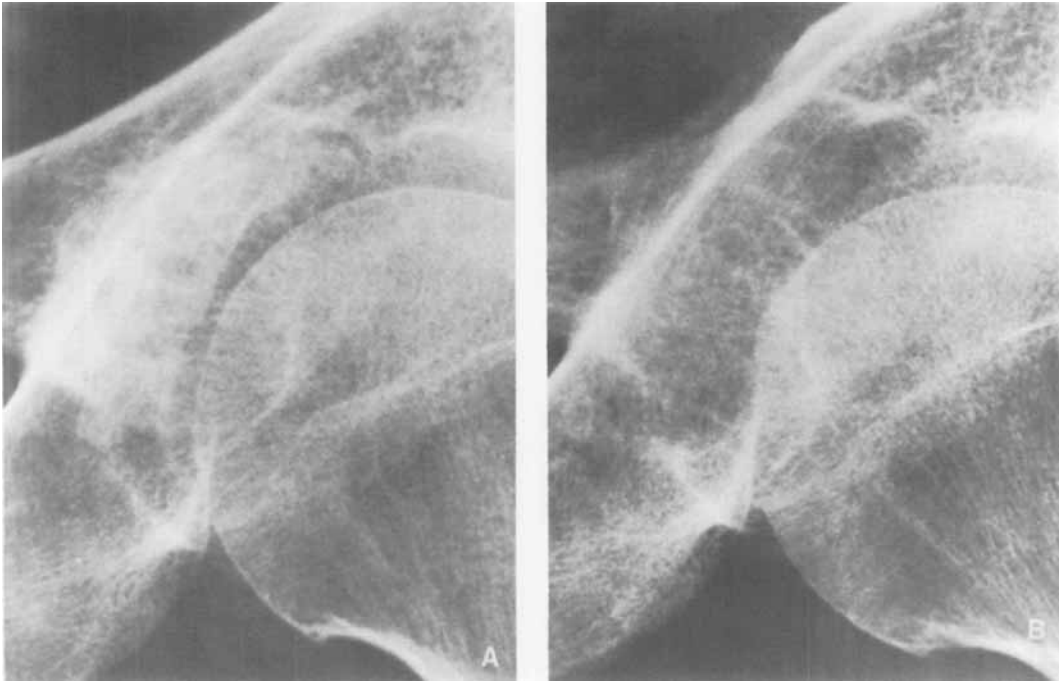


Figure 5 A. Case 2. Preoperative roentgenogram of the left hip joint (Lauenstein position) showing calcified mass in the acetabular fossa.

Figure 5 B. Postoperative roentgenogram of the same hip joint in the same position. The acetabular fossa with its pathological content (probably synovial osteochondromatosis) has been removed.

within some areas. Histopathologically, the removed mass consisted of fibrous adipose tissue partly covered by synovium. About 3 years later the patient presented with similar symptoms this time in the left hip joint. Plain radiography revealed flattening of the femoral head and arthrography showed a 1.5 by 2 cm large body in the acetabular fossa surrounded by contrast medium (Figure 4). At transacetabular arthrotomy this body proved to be loose and could easily be removed; it consisted of cartilage (inset in Figure 4). Following the two operations the patient occasionally has experienced pain in the right hip during physical activities, e.g. when playing soccer, but he is completely free from symptoms on the left side.

Case 2. A 56-year-old man had suffered pain in the left hip for about half a year, both while walking and at rest. Radiography, including tomography, revealed that the acetabular fossa was filled with a calcified mass (Figure 5 A). At transacetabular arthrotomy this mass, which appeared to consist of partly ossified cartilaginous tissue, was found to be firmly fixed to the acetabulum, and in order to remove all pathological tissue it was necessary to chisel away the whole acetabular fossa (Figure 2 and 5 B). A few loose cartilaginous bodies were also removed. The probable diagnosis after histopathologi-

cal examination was synovial osteochondromatosis. The operation was facilitated by partial removal of the superior ramus of the pubic bone (Figure 2). One year and a half after the operation a cicatricial hernia was repaired. At follow-up 4 years postoperatively the patient was free of symptoms.

DISCUSSION

An advantage of this method is that the acetabular fossa can be approached without any risk of damaging the nutrition of the femoral head. Damage to the ligamentum teres can easily be avoided as this ligament is not attached to the acetabular fossa but to the transverse ligament and the margins of the acetabular notch (Grant 1962). The small artery that accompanies the ligamentum teres to the femoral head is a branch of the obturator artery (Grant 1962), but the division and ligation of the obturator artery inside the pelvis does not stop the blood-flow in the ligamental artery: outside the pelvis, branches of

the obturator artery anastomose with branches of the medial circumflex femoral artery (Lang & Wachsmuth 1972). Anyhow, it is most probable that no part of the femoral head depends for its survival on the ligamental artery as long as the blood supply to the femoral head from the lateral and medial circumflex arteries is intact: branches of these arteries anastomose with branches of the ligamental artery within the femoral head (Wertheimer & Lopes 1975). In Case 2, the artery of the ligamentum teres was probably divided when the bone under the transverse ligament was removed (Figure 2). If this were the case, the collateral circulation mediated by the branches of the circumflex arteries apparently has been sufficient to prevent nutritional disturbances of the femoral head: the patient has no symptoms of avascular necrosis 4 years after operation.

The severance of the tendon of the ipsilateral rectus abdominis muscle facilitates the approach to the lateral wall of the lesser pelvis and the exposure of the bony pelvis opposite the

acetabulum. The severance of the contralateral rectus abdominis muscle facilitates the application of the strokes on the chisel when opening the acetabular fossa and makes it easier to inspect the femoral head. For making the hole in the bone it is convenient to use chisels that are bent so that the cutting force is directed more or less perpendicular to the surface of the bone.

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